



(51) International Patent Classification:
C30B 15/02 (2006.01) C30B 29/06 (2006.01)

(21) International Application Number:
PCT/US2024/030923

(22) International Filing Date:
24 May 2024 (24.05.2024)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
18/326,343 31 May 2023 (31.05.2023) US

(71) Applicant: **GLOBALWAFERS CO., LTD.** [CN/CN]; No. 8, Industrial East Road 2, Science-Based Industrial Park, Hsinchu City, 30075 (TW).

(72) Inventors: **SHIU, Chun Leung**; No. 8, Gongye E. 2nd Rd., East District, Hsinchu City, 30075 (TW). **LAI, Ming-Hsien**; No. 8, Gongye E. 2nd Rd., East District, Hsinchu City, 30075, Taiwan R.O.C., Hsinchu City, 30077 (TW). **WU, Yu-Chiao**; 501 Pearl Drive, St. Peters, Missouri 63376 (US).

(74) Agent: **MUNSELL, Michael G.** et al.; Armstrong Teasdale LLP, 7700 Forsyth Blvd., Suite 1800, St. Louis, Missouri 63105 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, ME, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

(54) Title: **INGOT PULLER APPARATUS INCLUDING AUTOMATED FEED ASSEMBLY FOR CHARGING SEMICONDUCTOR MATERIAL**

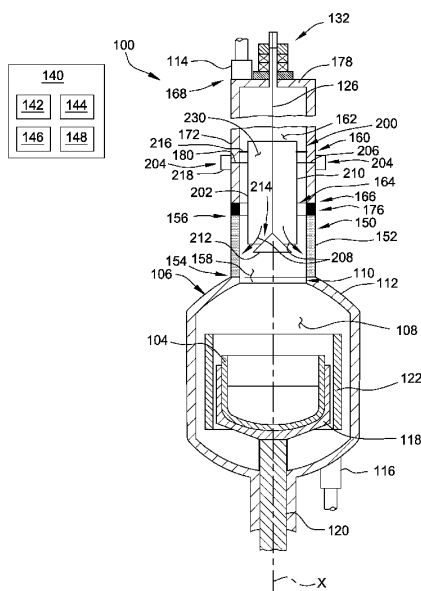


FIG. 2

(57) Abstract: An ingot puller for producing a single crystal semiconductor ingot includes a housing defining a growth chamber, a crucible positioned within the growth chamber, an ingot receiving vessel defining an ingot receiving chamber connected with the growth chamber, and a feed assembly for charging semiconductor material to the crucible. The feed assembly includes a dumper for containing the semiconductor material and moveable in the ingot receiving chamber between a raised position and a lowered position. The dumper includes a bottom and a sidewall releasable from the bottom to allow the semiconductor material to exit the dumper. The feed assembly also includes opening pins selectively extendable into and retractable from the ingot receiving chamber. The opening pins engage the dumper when extended into the ingot receiving chamber to release the dumper sidewall from the dumper bottom as the dumper is moved towards the lowered position.

[Continued on next page]

Published:

— with international search report (Art. 21(3))